

Lesson 30 Worksheet
Math for standards
SHOW ALL WORK!!!

Name _____

Date _____

1. Calculate the following by hand.

a. ${}_7P_4$

b. ${}_7C_4$

c. ${}_{15}P_3$

d. ${}_{13}C_5$

e. ${}_9P_1$

f. ${}_{10}C_9$

2. **Determine first whether the situation is a permutation or a combination. Then find the answer.**

a. In how many different ways can you arrange the letters a, b, c, d, e, f, and g?

b. How many different four-digit numbers can be formed by the digits 1, 2, 3, 4, 5, 6, and 7?

c. A committee of four people is to be selected at random from a group of 30 people that includes Scott, Shelby, Damian, and Kenny. Find the probability that the committee will consist of Scott, Shelby, Damian, and Kenny.

d. There are ten finalists for a geography bee. Gift certificates are awarded for first, second, and third place. In how many different ways can the prizes be awarded?

e. How many different ways can two captains be chosen from a team of 20 people?

f. In how many different orders can 12 e-mail messages be read?

g. A random drawing is held to determine the class representatives. Two students will be chosen from a class of 15 students. How many different pairs of students can be chosen?

h. In how many different ways can 8 classes be scheduled in a 8-period day?

i. How many different three-digit numbers can be formed by the digits 1, 2, 3, 4, 5, and 6 if each digit can be used only once?

j. In how many different ways can six books be placed next to each other on a shelf if the books on the ends do not change?

Open-Ended Question: Make sure as you answer the open-ended question that you show your work AND explain how you know you are doing the correct work. YOU MUST EXPLAIN WHAT YOU ARE DOING!!!

Consider the formulas for permutations and combinations:

$${}_nP_r = \frac{n!}{(n-r)!} \qquad {}_nC_r = \frac{n!}{(n-r)!r!}$$

A. In general, will a permutation or a combination produce a greater result for the same values of n and r ? Explain your reasoning.

B. Using your reasoning in part A, give an example that illustrates how you know your answer is correct.